

What is claimed is

1 1. An image processing apparatus comprising:
2 an acquisition unit for acquiring image data that
3 includes a plurality of pixels, each of which is set as a
4 target pixel to be judged;
5 a color pixel judgment unit for judging whether the target
6 pixel is a color pixel, the color pixel being a pixel other
7 than a monochrome pixel;
8 a color area judgment unit for judging whether the target
9 pixel is in a color area that includes a plurality of color
10 pixels, by referring to a judgment result of the color pixel
11 judgment unit;
12 a character-halftone judgment unit for judging whether
13 the target pixel is in an edge area of a character that is
14 present on a halftone-dot area; and
15 a switch unit for switching, when a judgment result of
16 the character-halftone judgment unit is affirmative, an
17 operation of image processing to be performed on the target
18 pixel in accordance with a judgment result of the color pixel
19 judgment unit and a judgment result of the color area judgment
20 unit.

1 2. The image processing apparatus of Claim 1,
2 wherein the character-halftone judgment unit includes:

3 an edge judgment unit for judging whether the target
4 pixel is in an edge area of a character; and
5 an isolated pixel judgment unit for judging whether the
6 target pixel corresponds to an isolated pixel, and
7 the character-halftone judgment unit judges whether the
8 target pixel is in an edge area of a character that is present
9 on a halftone-dot area, by referring to a judgment result
10 of the edge judgment unit and a judgment result of the isolated
11 pixel judgment unit.

1 3. The image processing apparatus of Claim 2,
2 wherein the character-halftone judgment unit includes:
3 an edge continuity judgment unit for judging a continuity
4 of pixels that are each judged to be in an edge area of a
5 character, by referring to a judgment result of the edge
6 judgment unit relating to a plurality of pixels in a first
7 window of a predetermined size that includes the target pixel;
8 and
9 an isolated pixel counter for counting a number of
10 isolated pixels in a second window of a predetermined size,
11 by referring to a judgment result of the isolated pixel judgment
12 unit relating to the plurality of pixels in the second window,
13 wherein the character-halftone judgment unit judges
14 whether the target pixel is in an edge area of a character
15 that is present on a halftone-dot area, by referring to a

16 judgment result of the edge continuity judgment unit and the
17 number of isolated pixels counted by the isolated pixel
18 counter.

1 4. The image processing apparatus of Claim 2,
2 wherein the isolated pixel judgment unit judges whether
3 the target pixel corresponds to an isolated pixel, by referring
4 to brightness of a plurality of pixels in a window of
5 predetermined size that includes the target pixel.

1 5. The image processing apparatus of Claim 1,
2 wherein the switch unit switches the operation of the
3 image processing between operations of (a) performing edge
4 enhancement and (b) not-performing edge enhancement.

1 6. The image processing apparatus of Claim 1,
2 wherein the switch unit switches the operation of the
3 image processing to be performed on the target pixel, to an
4 operation of not performing edge enhancement that involves
5 (a) attenuation of color components and (b) enhancement of
6 black components, when the color pixel judgment unit judges
7 that the target pixel is not a color pixel and the color area
8 judgment unit judges that the target pixel is not in a color
9 area.

1 7. An image forming apparatus comprising:

2 an acquisition unit for acquiring image data that

3 includes a plurality of pixels, each of which is set as a

4 target pixel to be judged;

5 a color pixel judgment unit for judging whether the target

6 pixel is a color pixel, the color pixel being a pixel other

7 than a monochrome pixel;

8 a color area judgment unit for judging whether the target

9 pixel is in a color area that includes a plurality of color

10 pixels, by referring to a judgment result of the color pixel

11 judgment unit;

12 a character-halftone judgment unit for judging whether

13 the target pixel is in an edge area of a character that is

14 present on a halftone-dot area;

15 a selector for selecting, when a judgment result of the

16 character-halftone judgment unit is affirmative, an

17 operation of image processing to be performed on the target

18 pixel in accordance with a judgment result of the color pixel

19 judgment unit and a judgment result of the color area judgment

20 unit;

21 an image correction unit for correcting the image data,

22 in accordance with a selection result of the selector; and

23 an image forming unit for forming an image, based on

24 the image data corrected by the image correction unit.

1 8. The image forming apparatus of Claim 7,
2 wherein the character-halftone judgment unit includes:
3 an edge judgment unit for judging whether the target
4 pixel is in an edge area of a character; and
5 an isolated pixel judgment unit for judging whether the
6 target pixel corresponds to an isolated pixel,
7 wherein the character-halftone judgment unit judges
8 whether the target pixel is in an edge area of a character
9 that is present on a halftone-dot area, by referring to a
10 judgment result of the edge judgment unit and a judgment result
11 of the isolated pixel judgment unit.

1 9. The image forming apparatus of Claim 8,
2 wherein the character-halftone judgment unit includes:
3 an edge continuity judgment unit for judging a continuity
4 of pixels that are each judged to be in an edge area of a
5 character, by referring to a judgment result of the edge
6 judgment unit relating to a plurality of pixels in a first
7 window of a predetermined size that includes the target pixel;
8 and
9 an isolated pixel counter for counting a number of
10 isolated pixels in a second window of a predetermined size,
11 by referring to a judgment result of the isolated pixel judgment
12 unit relating to the plurality of pixels in the second window,
13 wherein the character-halftone judgment unit judges

14 whether the target pixel is in an edge area of a character
15 that is present on a halftone-dot area, by referring to a
16 judgment result of the edge continuity judgment unit and the
17 number of isolated pixels counted by the isolated pixel counter.

1 10. The image forming apparatus of Claim 8,
2 wherein the isolated pixel judgment unit judges whether
3 the target pixel corresponds to an isolated pixel, by referring
4 to brightness of a plurality of pixels in a window of a
5 predetermined size that includes the target pixel.

1 11. The image forming apparatus of Claim 7,
2 wherein the selector selects the operation of the image
3 processing from operations of (a) performing edge enhancement
4 and (b) not-performing edge enhancement.

1 12. The image forming apparatus of Claim 7,
2 wherein the selector selects the operation of the image
3 processing to be performed on the target pixel, as an operation
4 of not-performing edge enhancement that involves (a)
5 attenuation of color components and (b) enhancement of black
6 components, when the color pixel judgment unit judges that
7 the target pixel is not a color pixel and the color area judgment
8 unit judges that the target pixel is not in a color area.

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1 13. An image processing method comprising:
2 an acquisition step for acquiring image data that
3 includes a plurality of pixels, each of which is set as a
4 target pixel to be judged;
5 a color pixel judgment step for judging whether the target
6 pixel is a color pixel, the color pixel being a pixel other
7 than a monochrome pixel;
8 a color area judgment step for judging whether the target
9 pixel is in a color area that includes a plurality of color
10 pixels, by referring to a judgment result in the color pixel
11 judgment step;
12 a character-halftone judgment step for judging whether
13 the target pixel is in an edge area of a character that is
14 present on a halftone-dot area; and
15 a selection step for selecting, when a judgment result
16 in the character-halftone judging step is affirmative, an
17 operation of image processing to be performed on the target
18 pixel in accordance with a judgment result in the color pixel
19 judging step and a judgment result in the color area judging
20 step.

1 14. The image processing method of Claim 13,
2 wherein the character-halftone judgment step includes:
3 an edge judgment sub-step for judging whether the target
4 pixel is in an edge area of a character; and

5 an isolated pixel judgment sub-step for judging whether
6 the target pixel corresponds to an isolated pixel,
7 wherein in the character-halftone judgment step,
8 whether the target pixel is in an edge area of a character
9 that is present on a halftone-dot area is judged, by referring
10 to a judgment result in the edge judgment sub-step and a judgment
11 result in the isolated pixel judgment sub-step.

1 15. The image processing method of Claim 14,
2 wherein the character-halftone judgment step includes:
3 an edge continuity judgment sub-step for judging a
4 continuity of pixels that are each judged to be in an edge
5 area of a character, by referring to a judgment result in
6 the edge judgment step relating to a plurality of pixels in
7 a first window of a predetermined size that includes the target
8 pixel; and
9 an isolated pixel count sub-step for counting a number
10 of isolated pixels in a second window of a predetermined size,
11 by referring to a judgment result in the isolated pixel judgment
12 step relating to the plurality of pixels in the second window,
13 wherein in the character-halftone judgment step,
14 whether the target pixel is in an edge area of a character
15 that is present on a halftone-dot area is judged, by referring
16 to a judgment result in the edge continuity judgment sub-step
17 and the number of isolated pixels counted in the isolated

18 pixel count sub-step.

1 16. The image processing method of Claim 14,
2 wherein in the isolated pixel judgment step, whether
3 the target pixel corresponds to an isolated pixel is judged,
4 by referring to brightness of a plurality of pixels in a window
5 of a predetermined size that includes the target pixel.

1 17. The image processing method of Claim 13,
2 wherein in the selection step, the operation of the image
3 processing is selected from operations of (a) performing edge
4 enhancement and (b) not-performing edge enhancement.

1 18. The image processing method of Claim 13,
2 wherein in the selection step, the operation of the image
3 processing to be performed on the target pixel is selected
4 as an operation of not performing edge enhancement that
5 involves (a) attenuation of color components and (b)
6 enhancement of black components, when the target pixel is
7 judged not to be a color pixel in the color pixel judgment
8 step and the target pixel is judged not to be in a color area
9 in the color area judgment step.